



# SUMMER

## Math Guide

# KINDERGARTEN

### BUILD FLUENCY

Quick activities to try at home to build fluency skills from a foundation of conceptual understanding

### ENGAGE IN PROBLEM SOLVING

Real world math examples to support problem solving skills

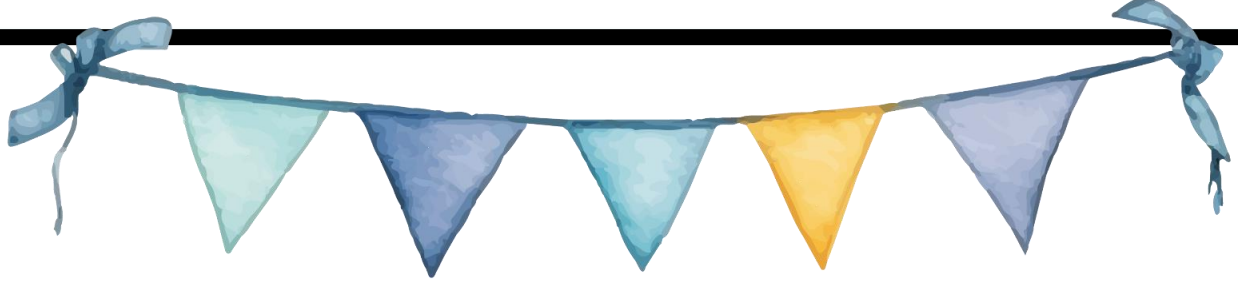
### MAINTAIN SKILLS & PREVENT THE SUMMER SLIDE

Critical focus areas to prevent the summer slide and help children maintain their math skills

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# SUMMER

## Math Guide



### **This is the guide you've been waiting for!**

Finally, a way to support your child with math over the summer without spending a fortune on materials, private tutoring or other resources.

The Math Coach Connection Summer Math Guide was designed to help caregivers support their children with the core content areas of math over the summer, with activities that integrate into your daily routine!

This guide includes information about grade-level math expectations from Kindergarten, as well as the upcoming content covered in 1<sup>st</sup> Grade math. It includes a page for each core focus area for the grade level as well as a bonus fluency page, goal setting page and additional resource page (with links to helpful podcast episodes)! A total of 12 concise, high-impact pages! Each page has ways to integrate math practice into your daily routine over the summer. The Kindergarten Summer Math Guide includes a page for each of the following categories: Fluency Focus (addition and subtraction within 5), counting and cardinality, addition within 10, subtraction within 10, composing and decomposing numbers 11-20, measurement and data and geometry.

#### **Every page includes:**

- Math Skills Activities: Easy, no-prep ways to help your child practice Kindergarten math skills at home.
- Math Talk Moments: conversation starters to get your child talking about (and understanding) math
- Math Models: visual models of math concepts that Kindergarteners use for problem solving
- Math At Mealtime: ways to seamlessly integrate math into cooking, baking or prepping a meal. Since this is already a part of the daily routine, it is a natural place to integrate real-world, hands-on mathematics.
- Math 'Did You Know' Facts: important tips and information about Kindergarten math skills
- Family Read Aloud & Game Ideas: a curated list of high-quality math books and games related to each focus area. These lists were designed specifically for first graders and their families.

**Check out the following pages for more information on how to use the Summer Math Guide.**

## HOW TO USE

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## Make Math Meaningful Over The Summer

This guide was created to make it easier for families to support their children with maintaining math skills over the summer. Practicing math skills over the summer is critical for preventing the summer slide. Integrating math practice into the daily routine, as well as spending some focused time on math practice will help set your child up for success as they start next school year. Time and resources are often a barrier to being able to practice math at home which is why the activities included in this guide are:

- **Integrated into everyday activities**, so they don't take much additional time and can often be done on the road, during mealtime or throughout the daily routine. This also helps children understand that math is part of the real world. These real-world examples make math more meaningful and build conceptual understanding.
- **Low cost**: The materials needed for all activities are materials you likely have around your home, or can be purchased at a low price, or borrowed. For example, playing cards, a dice, paper, pencil, various food items. *Most of the books included in the 'read aloud' section are available at local libraries.*
- **Low Prep, High Impact**: The conversation starters, activities, books and games listed in this guide are **high-interest** activities that will engage your child in meaningful math practice, while not taking much advanced time for you to prepare.

## A Few Notes

- This guide is **not intended to replace summer school programs**. It is meant to supplement summer school and/or provide a guide for families to support children who are not in summer school math programs.
- This guide covers the **core content of Kindergarten**. However, it does not cover all skills. It focuses heavily on counting, addition and subtraction fluency and strategies.
- The activities in this guide are suggestions. You do not need to complete every activity and you can modify activities as needed to provide more support or make them more challenging.

## Sample Schedule

*Every child is different, and everyone's summer break is different. That's why the activities in this guide can be modified and the schedule can be adjusted to meet the needs of your child. You can also choose to focus more on just the areas in which your child needs the most support. You can shorten the schedule or extend it as needed. If it is helpful, use this sample schedule to plan your summer math practice.*

### Week 1

**Fluency Focus  
(Addition/  
Subtraction  
within 5)**

### Week 2

**Counting**  
Focus on one-to-one  
correspondence

### Week 3

**Cardinality**  
Focus on naming  
numbers and counting  
sets

### Week 4

**Addition  
(within 10)**  
Spiral back to use  
facts within 5

### Week 5

**Subtraction  
(within 10)**  
Spiral back to use  
facts within 5

### Week 6

**Base Ten  
Number System**  
*Composing and decomposing  
numbers 11-20*

### Week 7

**Measurement  
& Data**  
Use addition and  
subtraction skills to  
support problem solving

### Week 8

**Geometry**  
Spiral back for  
additional fluency  
practice

# HOW TO USE

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## Quick Skills Check

- ❑ *In this section, you will see a brief checklist of skills related to the math concept listed at the top of the page. This does not cover all grade level skills but focuses on core skills to support understanding and fluency. This is helpful to check in with your child's current level of understanding.*

## Math Talk Moments

*Some conversation starters for engaging your child in math talk.*

*This section includes short conversation starters to engage your child in conversations about math. These are helpful for building mental math skills and thinking about math in the real world. The questions are designed to be modified as needed, or to be used more than once but with different numbers/topics.*

## Activities to Build MATH SKILLS

- ❑ *This section includes brief activities that you can do with your child to help them build understanding and fluency skills within the topic area. Some activities require materials, but most materials are ones that you can easily find at home (or can be borrowed or purchased at a low cost).*
- ❑ *Helpful materials to have on hand are*
  - ❑ *A dice*
  - ❑ *A deck of cards*
  - ❑ *Pencil and paper*
- ❑ *These activities are easily modified to provide more of a challenge or to provide more support. You can keep track of the activities you try on the checklist to hold your child accountable for math practice.*
- ❑ *These activities can be done independently, or one-on-one with a parent/teacher/supporter. They are family friendly and can be done with the whole family too.*

## Math Models

*This section will show visual models that are frequently used within the focus area. These are not all the grade level strategies that children learn, but provide a helpful visual so you know more about the strategies they might be using for problem solving.*

## Math at Mealtime

*Mealtime is a perfect time to integrate math into the conversation. It also has many great examples of real-world math application. This section includes easy ways to integrate math skills into snack time, cooking, baking, planning and eating a meal.*

## Did You Know?

*This section includes important information for families to know regarding the specific skills and strategies for the focus area. It shows how this grade-level math fits into the progression of K-5 math.*

## Family Read Aloud Books & Games

*In this section you will find a list of books and/or games that support the skills needed for the mathematical focus area. These high-quality books and games integrate perfectly into family game night or read aloud time and help children apply their math skills to real-world situations and games.*

# GOAL SETTING

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## Set Yourself Up For Success!

Use the space below to set some goals for the summer. Whether your goals are gaining new understanding of difficult math concepts, building fluency with your math facts, maintaining your math skills or anything in between, this goal setting sheet can help hold you accountable. Write down 3 goals you have for yourself this summer and then 3 things you can do to help you be successful. Set yourself up for success by trying your best!

### My Summer MATH GOALS

1

2

3

### Steps to SUCCESS

1

2

3





# SUMMER

## Math Guide

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### HERE'S AN OVERVIEW OF WHAT KINDERGARTENERS LEARNED IN MATH THIS YEAR

Kinder

#### Counting & Cardinality

##### Count within 100 & Develop Cardinality

- Count to 100 by ones and tens (*some states require fives as well*)
- Count backward from 10
- Count forward beginning from a given number within the known sequence (instead of having to start at 1)
- Write numbers from 0-20 and represent a number of objects with a written numeral.
- Understand the relationship between numbers and quantities (connect counting to cardinality)
- When counting objects, say the number names in standard order using one-to-one correspondence
- Recognize that the last number name said tells the number of objects counted
- Recognize that each successive number name refers to a quantity that is one greater
- Count to answer 'how many?' questions about as many as 20 things arranged in a line, rectangular array or circle (or as many as 10 things in a scattered configuration)
- Given a number 1-20, count out that many objects
- Identify whether the number of objects in one group is greater than, less than or equal to the number of objects in another group
- Compare two given numbers up to ten using the terms greater than, less than or equal to.

Kinder

#### Operations & Algebraic Thinking and Numbers and Operations in Base Ten

##### Fluently add and subtract within 5

- Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations
- Add and subtract within 10 to solve contextual problems using objects or drawings to represent the problem
- Decompose numbers less than or equal to 10 into addend pairs in more than one way using objects or drawings. Record each decomposition using a drawing or by writing an equation
- Find the number that makes 10 when added to any given number from 1 to 9 using objects or drawings. Record the answer using a drawing or written equation
- **Fluently add and subtract within 5**
- Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as  $18 = 10 + 8$ ); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Kinder

#### Measurement & Data

##### Notice measurable attributes of objects and compare

- Describe measurable attributes of objects such as length or weight
- Directly compare two objects with a measurable attribute in common to see which object has more of/less of the attribute (*for example, compare the height of two objects to see which is taller or shorter*)
- Sort a collection of objects into a given category with 10 or less in each category. Compare the categories by size
- *Some states require identification of the penny, nickel, dime and quarter and recognizing the value of each.*

Kinder

#### Geometry

##### Identify and Compare Shapes

- Describe objects in the environment using names of shapes
- Describe relative position of objects using terms such as *above, below, beside, in front of, behind, between and next to*
- Correctly name shapes regardless of their orientations or overall size
- Identify shapes as two-dimensional or three-dimensional
- Describe similarities and differences between two- and three-dimensional shapes, in different sizes and orientations
- Model shapes in the world by building and drawing shapes
- Compose larger shapes using simple shapes and identify smaller shapes within a larger shape



# SUMMER

## Math Guide

1ST  
GRADE

HERE'S WHERE KINDERGARTENERS ARE HEADED IN  
THEIR LEARNING NEXT YEAR IN 1<sup>ST</sup> GRADE

### Operations & Algebraic Thinking <sup>1<sup>st</sup></sup>

Fluently add and subtract within 10

- Use addition and subtraction within 20 to solve word problems involving adding to, taking from, putting together, taking apart and comparing with the unknown in all positions
- Solve word problems that call for addition of three whole numbers with sum less than 20
- Apply properties of operations as strategies to add and subtract
- Understand subtraction as an unknown-addend problem
- Relate counting to addition and subtraction
- Add and subtract within 20 **demonstrating fluency of addition and subtraction within 10.**  
*Note: some states expect fluency within 20 at this grade level.*
- Understand the meaning of the equal sign
- Determine the unknown whole number in addition and subtraction equations relating three whole numbers

### Numbers & Operations in Base Ten <sup>1<sup>st</sup></sup>

Understand the Base Ten System and Add within 100

- Count to 120 starting at any number less than 120.
- Read and write numbers to 120 and represent a number of objects with a written number
- Understand that the two digits of a two-digit number represent amounts of tens and ones
- Understand that 10 can be thought of as ten ones
- Understand that the numbers between 11-19 are composed of a ten and a set number of ones
- Understand that the numbers 10,20,30,40,50,60,70,80,90 refer to a set number of tens and zero ones
- Compare 2 two-digit numbers based on the meaning of the tens and ones-digit
- Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of ten.
- Given a two-digit number, mentally find 10 more or 10 less than the number without having to count
- Subtract multiples of ten in the range 10-90 from multiples of ten in the range 10-90 using concrete models.

### Measurement & Data <sup>1<sup>st</sup></sup>

Use linear measurement tools to measure objects and collect data

- Order three objects by length; compare the lengths of two objects directly by using a third object
- Express the length of an object as a whole number of unit lengths by laying multiple copies of a shorter object (length unit) end to end.
- Tell and write time in hours and half-hours using analog and digital clocks
- Organize, represent and interpret data with up to three categories. Ask and answer questions about the data set

### Geometry <sup>1<sup>st</sup></sup>

Identify and partition shapes

- Distinguish between defining attributes (ex: triangles are closed and 3-sided) vs. non-defining attributes (color, orientation, overall size).
- Build and draw shapes with defining attributes
- Compose two-dimensional shapes or three-dimensional shapes to create a composite shapes
- Partition circles and rectangles into two and four equal shares. Use the words halves, fourths and quarters. Understand decomposing into more shares creates smaller shares.

# FLUENCY FOCUS

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### Quick Skills Check

- I can add and subtract within 5

### What Does FLUENCY Mean

Being able to solve a problem both **quickly and accurately**. Children who are fluent in a particular skill, can think **flexibly** about how to solve the problem. Fluency **does not mean memorization**. Although fluency often leads to memorization of math facts.

### Activities to Build FLUENCY

- Use 'think' problems (or anchor facts) to help you solve larger problems
- Try solving a problem two ways. Use this to check your work to make sure your answer was the same both times. Decide which way was the most efficient/fastest.
- Play a fluency game: any game that requires you to solve a problem with accuracy, quickly. An example is 'Number Hat': Write numbers 0 - 5 on pieces of paper and crumple them up and put them in a hat or bowl. Take turns drawing a number from the hat. Players look at the number and then say what they would have to add to that number to have a sum of 5. *For example, if they draw a 2, they would say 2 + 3 more makes 5.* Try to use mental math to find the way to make 5. *For an extension, players can draw two numbers from the hat and add those two numbers together (note, sums may be larger than 5 in this situation, so children may need to use a model to solve).*
- Practice solving a set of problems mentally. Visualize how to solve the problem in your head to build mental math skills
- Focus on doubles and doubles plus one facts. For example:  $1 + 1$  and  $1 + 2$ , or  $2 + 2$  and  $2 + 3$ . These facts are related because you can use the doubles fact to help you find the sum of the larger problem.
- Share your thinking aloud by talking to a family member or teacher about your strategy
- Utilize the commutative property. If it is challenging to solve  $1 + 4$ , switch the order of the addends to add it  $4 + 1$  instead.
- Make fact families: Knowing that  $3 + 1 = 4$  can help a child know that  $4 - 3 = 1$ .

$$2 + 3$$

Think:  $(2 + 2)$  add 1 more

The goal of a 'think' problem is to use a smaller problem that a child knows (or has memorized) to support them in solving larger problems. In this case, if they know their doubles facts (such as  $2 + 2$ ), they can start with that and then add 1 more (breaking the 3 apart into  $2 + 1$ ). They could also start with any other smaller problem that they know fluently.

### Did You Know?

Fluency cards & flash cards don't have to be boring! You can 'build a road' with fluency cards, or play 'clear the table' or 'memory.' For more ideas: listen to Episode 16 of The Dog Ate My Homework Podcast.

Also, fluency within 5 looks different from fluency within larger numbers in upper grades. Fluency within 5 should be quick mental math (and sometimes memorization), while fluency within 10 or 20 might require longer think time or more strategy usage.

### Track Your Progress

Make a chart of 'math facts I know' and 'math facts I'm working on' to keep track of your progress. Update your chart regularly to keep track of your growth!



# COUNTING

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## Quick Skills Check

- I can count to 100 by ones and tens (*some states require fives as well*)
- I can count backward from 10
- I can count forward beginning from a given number within the known sequence (instead of having to start at 1)
- I can write numbers from 0-20 and represent a number of objects with a written numeral.
- When counting objects, I can say the number names in standard order using one-to-one correspondence

## Math Talk Moments

Some conversation starters for engaging your child in math talk.

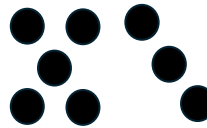
- Let's practice counting to 100 together. Do you like to count by ones, fives or tens best? Why? *Then alternate counting, so your child says 10, you say 20, they say 30, you say 40 and so on.*
- What is your favorite number? Why is that your favorite number? Show me how you can count to that number (*try by ones, fives or tens—notice if it is not a multiple of 5 or 10, they won't 'land' on it while counting which is a fun discussion to consider*). Or, start at that number and count to 100.
- How many fingers do you have on your hands? How many toes do you have on your feet? How many fingers do we have combined? Can you show me how you could count them?

## Activities to Build COUNTING SKILLS

- Play 'Blast Off!' Find a situation that would require a countdown: *for example, launching a stomp rocket, or throwing a paper airplane to see how far it goes, or running a race against each other around the block.* Have your child count down from 10, accurately counting and not skipping any numbers in the sequence. You can also practice having them start at other numbers (less than 10, for example starting at 7, or if they need more of a challenge, they can start from a number between 10-20).
- Incorporate math into mealtime. Find examples of counting problems while cooking, baking or serving a meal.
- Play 'Highest Count': Each player rolls one dice (or two dice for an added challenge). Then each player counts the total number of dots on the dice (or uses subitizing skills to 'just see' the total number). Then each player draws a picture with that many objects and writes the number (*for example, if you roll a 4, draw a picture with 4 stars, or 4 cars etc. and write the number 4*) and then counts to prove that you drew the correct number of objects, pointing to each object as they count. The person with the largest number gets a point for the round.
- Use hands-on manipulatives and visual models whenever possible for counting. Children should continue to practice accuracy as they count by touching/tapping each object.
- Play 'Play Doh Smash': roll play doh or other modeling clay into balls (number between 1-20). Then have your child press each ball/'smash it,' as they count and say each number. You can also tell your child a number and have them make that number of play doh balls (and then they can still smash them, or they can let you smash them and model counting).

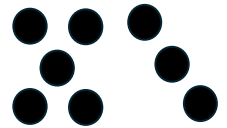
## Counting Models & Strategies

### Counting All



"One, two, three, four, five, six, seven, eight"

### Counting On



"Five, six, seven, eight"

## Math at Mealtime

- Put two countable foods on your child's plate. Ex: 4 carrots and 3 green beans. Ask, how many total vegetables are on your plate? How do you know? *Have your child practice 'counting all', so start at 1 and count all the foods together. Or practice 'counting on,' starting at 4 and then counting up 5,6,7.*
- Make a fruit salad. Use a different number of each fruit (ranging from 1-10). Have your child help you count how many of each fruit they put into the salad.

## Did You Know?

Kindergarteners are expected to learn one-to-one correspondence while counting. They are also expected to build subitizing skills, which means, the ability to 'just see' a number of dots/objects and know how many there are (*for example: seeing 5 dots on a dice and knowing its 5 without having to count all*). In Kindergarten this skill usually develops within 5 and sometimes 10. Giving children practice with dot patterns by using dice or other dot patterns frequently is key.

## Family Read Aloud Books & Games

- **Ten Black Dots** by Donald Crews
- **The Right Number of Elephants** by Jeff Sheppard
- **Anno's Counting Book** by Mitsumasa Anno
- **Zingo! Number Bingo 123** *a great game for building counting, subitizing and number matching skills*
- **Tiny Polka Dot** *a fun family game to engage children in counting and recognizing numbers*

# CARDINALITY

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## Quick Skills Check

- I can recognize that the last number name said tells the number of objects counted
- I know that each successive number name refers to a quantity that is one greater
- I can count to answer 'how many?' questions about as many as 20 things arranged in a line, rectangular array or circle (or as many as 10 things in a scattered configuration)
- Given a number 1-20, I can count out that many objects
- I can identify whether the number of objects in one group is greater than, less than or equal to the number of objects in another group and can compare numbers up to 10.

## Math Talk Moments


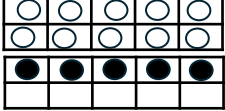
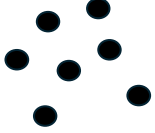

Some conversation starters for engaging your child in math talk.

- Would you rather have 4 M&Ms or 8 M&Ms (or use other food/object like blueberries, slices of pizza, carrots, toy cars, stuffies, pages of homework etc.)? Why? *Answers will vary based on whether it is a thing they like or do not like. This makes for great conversation about more or less than.*
- Find an object to count (*ex: toys in the bath, flowers in the garden, stickers on a chart, eggs in a carton etc.*). Have your child count the total and ask questions such as "How did you know there were that many?" "What was the last number you counted?" *Or compare different objects that you counted. Ex: "are there*
- Look around the car, train, bus or grocery store. How many \_\_\_\_ are there? *Count people in the car, carts at the store, apples on the display, people in line for checkout).*

## Activities to Build CARDINALITY SKILLS

- Give your child opportunities to count objects using one-to-one counting skills, but make sure to ask the question 'so how many are there?' at the end. This connects counting to cardinality. *Some real-world counting examples include: objects on a page in a book such as cars, flowers etc., flowers in a garden, stickers, marbles or rocks in a collection etc.*
- Incorporate math into mealtime. Find examples of counting problems while cooking, baking or serving a meal.
- Play 'Smaller Number': Write numbers 1-20 on scraps of paper or post-it notes. Fold them up and put the pieces in a hat or bowl. All players draw a number from the bowl. Then they draw that many objects (dots, stars, hearts etc.) on a ten frame. The player with the smaller number wins a point for that round. Continue playing until all numbers have been drawn. *For an added challenge, you can use numbers above 20 or a number more than once that you know is particularly challenging for your child.*
- Make a summer collection! Choose an object that your child likes, such as rocks, stickers, marbles, toy cars, unicorns, leaves etc. Go out on a scavenger hunt (or a scavenger hunt in their room) looking for as many of that object as possible. Have your child use counting skills to count how many they have in their collection and then write the corresponding number. *You can also keep track of the collection throughout the summer and record how many are in the collection each day/week.*
- Make a 'Toilet Roll Tower': have your child stack toilet paper rolls on top of each other as high as they can without having the tower fall over (it helps to secure the bottom one by taping it to the floor or sticking it down in play dough). Have your child count the rolls as they stack them. Once the tower is as high as they can make it,, have them count backwards as they take the rolls down one by one.

## Counting & Cardinality Models

<p>Ten Frame</p> 	<p>Double Ten Frame</p> 	<p>Scattered Configuration</p> 
<p>Rectangular Array</p> 		

## Math at Mealtime

- Have your child help you count out the food to put on each plate. For example: "can you help me put 5 carrot on each plate," or "I want to put 12 blueberries in each bowl, can you count them out and put them in the bowls for me please?"
- Ask your child 'would you like more pretzels or more Cheerios in your snack? Then count out more of one than the other and have your child count them to check to see that you gave them more of one than the other. *Modify with other small foods that are easy to count. Provide a ten frame if needed to organize counting. You can also have everyone at the table count the number of a certain food on their plate and discuss who has more or less.*

## Did You Know?

Cardinality means understanding that the last number counted in a set, is the number of objects in a set. If a child has cardinality, when they count a set of objects, they should be able to answer the question: 'so how many objects are there?' without recounting. This skill is an important foundation for all mathematical understanding, especially relating counting to addition and subtraction. counting skills for addition and subtraction.

## Family Read Aloud Books & Games

- **Pattern Breakers** by Daniel Finkel
- **Goodnight Numbers** by Danica McKellar
- **Hello! A Counting Book of Kindnesses** by Hollis Kurman
- **With a Cherry on Top family game** by Peaceable Games

# ADDITION

WITHIN  
10

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## Quick Skills Check

- I can represent addition with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations
- I can add within 10 to solve contextual problems using objects or drawings to represent the problem
- I can find the number that makes 10 when added to any given number from 1 to 9 using objects or drawings. Record the answer using a drawing or written equation
- I can fluently add within 5 (*some states require fluency within 10*)

## Math Talk Moments

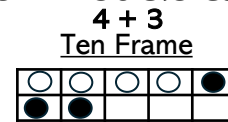
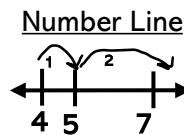
Some conversation starters for engaging your child in math talk.

- If I wanted to add the numbers  $3 + 4$ , what order should I add the numbers in? How would you solve this problem? *Emphasize looking for ways to make five such as  $4 + 1$  and then add 2 more. Also focus on starting with the larger number and adding on.*
- If I ate 3 carrot sticks for lunch and the same number for lunch as I had for dinner, how many apple slices did I eat all together today?
- I noticed there were 6 cars parked in the parking lot and 3 more cars just parked here. How many total cars are in the parking lot? *Or similar real-world question*

## Activities to Build ADDITION SKILLS

- Practice ways to make five. Start at a number (Ex: 2) and say what number you would need to add to it to get to five. " $2 + 3$  is 5." This supports efficient problem solving when breaking apart one addend with larger problems. *You can also extend this to ways to make ten.*
- Incorporate math into mealtime. Find examples of addition problems while cooking, baking or serving a meal.
- Play 'Largest Sum': Each player rolls two dice (or one dice twice). Each player adds together the two numbers rolled to get their sum. The person with the largest sum gets a point for that round. *Note, technically there can be sums of 11 and 12 in this game, so based on your child's needs you can have them re-roll if needed to get a smaller addend.*
- Use hands-on manipulatives and visual models whenever possible for problem solving.
- Play games with fact fluency cards to build addition fluency and mental math skills within 5 and then within 10.
- Make a nametag for yourself and your child with a difficult addition fact on it. For example:  $3 + 2$ . Then for the rest of the day you and your child call each other by 'name' and the name is the sum. *In this case, Mrs. 5.*
- Play 'Bean Bag Toss': Write numbers 0-9 on post-it notes and spread them out in a line on the ground. Have your child toss a bean bag, ball (or sock filled with other socks). Whatever number it lands on, the child has to say what they would add to that number to make ten. You can also play where you throw two bean bags and wherever they land, those two numbers become the addends.

## Addition Models & Strategies



Doubles

Ex:  $4 + 4$

Doubles Plus One  
Ex:  $4 + 5$  (think  $4 + 4$  and one more)

Start With the Larger  
Addend & Add On

$2 + 7$

$7 + 2$

Think: "7, 8, 9"

Anchor to a 5  
 $4 + 3$  (think  $4 + 1$  and add 2 more)

## Math at Mealtime

- Put two countable foods on your child's plate. Ex: 6 carrots and 3 green beans. Ask, how many total vegetables are on your plate? How do you know? How many more green beans will you need to make ten?
- Make a mini fruit salad. Use a different number of each fruit (ranging from 1-10). Add two fruit totals at a time together to find out how much total fruit you have (ex: 4 blueberries + 3 orange slices)

## Did You Know?

In Kindergarten, the goal of addition is to build conceptual understanding of the action of addition. It is important to practice a variety of addition contexts with children such as adding on and part-part whole. Ex: *There were 3 people at the park and 4 more joined vs. there were 3 yellow flowers and 4 purple flowers.*

## Family Read Aloud Books & Games

- **Ten For Me** by Barbara Mariconda
- **Carnival Counting** by Melanie Doppler
- **The Mission of Addition** by Brian P. Cleary
- **10 On The Spot! 10-Frame Game** by Learning Resources
- **Shut the Box** a fluency and mental math game
- **Clumsy Thief Jr. Math Game** focuses on ways to make ten

# SUBTRACTION WITHIN 10

# KINDER

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## Quick Skills Check

- I can represent subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations
- I can subtract within 10 to solve contextual problems using objects or drawings to represent the problem
- I can decompose numbers less than or equal to 10 into addend pairs in more than one way using objects or drawings.
- I can find the number that makes 10 when added to any given number from 1 to 9 using objects or drawings.
- I can fluently subtract within 5 (*some states require fluency within 10*)

## Math Talk Moments

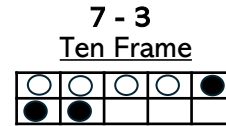
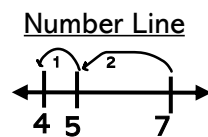
Some conversation starters for engaging your child in math talk.

- How could knowing that  $3 + 4 = 7$  help you solve the problem  $7 - 3$ ?
- There were 8 people at the park today and only 4 people at the park yesterday. How could we figure out how many more people are at the park today than yesterday?
- What is your favorite strategy to use for subtraction? Why?
- Notice subtraction situations to talk about as you drive or go somewhere new. For example: there are 9 total flowers in the bouquet, 5 are pink and the rest are purple. How many flowers are purple? Or I had \$7 and I spent \$3, how much money do I have left?

## Activities to Build SUBTRACTION SKILLS

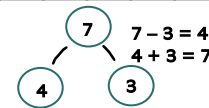
- Practice using addition to help support subtraction. Choose two problems (one that lends itself to adding up and one that lends itself to subtracting back). *For example:  $9 - 8$  and  $8 - 2$ .* Have your child help you solve both problems using an 'add up' strategy and a 'subtract back' strategy and determine which was more efficient for each problem. *Notice, that for  $9 - 8$  it is much more efficient to just add up from 8, rather than subtracting 8 back.*
- Incorporate math into mealtime. Find examples of subtraction problems while cooking, baking or serving a meal.
- Play 'What's The Difference': Both players choose a card from a deck (with no face cards). Find the difference between the cards you made. Compare your solution strategies. *You can also play this game with a dice for smaller numbers.*
- Use hands-on manipulatives and visual models whenever possible for problem solving. Use ten frames and number lines whenever possible. Also colored stacking cubes work well for modeling compare and part-part-whole subtraction.
- 'Act It Out': Think of a variety of subtraction situations (specifically subtracting back) and actually stand up and act out math problems together. Have your child think of real-world realistic problems to match an equation.
- Make fact families with addition and subtraction within 20. For example:  $6 + 8 = 14$  so  $14 - 6 = 8$ .

## Subtraction Models



Use Addition To Find Difference  
 $7 - 3 = \underline{\quad}$   
 Reframe the problem to think  $3 + \underline{\quad} = 7$

Use a Fact Family/Make a Number Bond



Anchor to a 5  
 $7 - 3 = 4$       $7 - 2 = 5$   
 $2 + 1$       $5 - 1 = 4$

## Math at Mealtime

- Give your child a different amount of an item within 10 (pretzels, crackers, berries etc.) than yourself. 'How many more pretzels did you get than me? How do you know?'
- Put a set amount of a specific food on your plate. Such as 6 carrots. As you eat, say aloud the subtraction expression to match. 'I had 6 carrots, and I ate 4. How many do I have left?' *Write the subtraction expression to match.*
- Keep track of how many apples (oranges or other fruit) you have left throughout the week. Ex: We started with 10 apples. Now we have 8. How many did we eat?'

## Did You Know?

In Kindergarten, the goal of subtraction is to build conceptual understanding of the action of subtraction. It is important to practice a variety of addition contexts with children such as subtracting back, missing addend, part-part-whole and compare problems

## Family Read Aloud Books & Games

- **The Action of Subtraction** by Brian P. Cleary
- **Subtraction Action** by Loreen Leedy
- **If You Were a Minus Sign** by Trisha Speed Shaskan
- **Pigeon Math** by Asia Citro
- **Pete the Cat and His Four Groovy Buttons** by Eric Litwin
- **Race to Planet X: A number bond game**
- **Pop for Addition and Subtraction Game** by Hand 2 Mind



# BASE TEN & PLACE VALUE

KINDER

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## Quick Skills Check

- I can compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as  $18 = 10 + 8$ )
- I understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

## Math Talk Moments

Some conversation starters for engaging

*your child in math talk.*

- Your cousin (or brother or sister) is 13 years old (or pick another family member who is between the ages of 11-19). Can you write that number on a piece of paper? How many tens are in that number? How many ones are in that number? How could we draw a picture to model this number?
- We spent \$12 on gas this week and \$18 on gas this week (or pick another number within the 11-19 range). What does the 1 mean in each of those numbers? What does the 2 and the 8 represent?
- Think about the number 2 and 12. What makes those numbers different? What is similar?
- How many ones are in the number 10. Explain your thinking.

## Activities to Build

### PLACE VALUE UNDERSTANDING

- Practice renaming a number. Choose a number 11-19 to make using base ten blocks (a homemade base ten model with pretzel rods for tens and Cheerios for ones works great too or a quick picture). For example: 14 would have 1 ten and 4 ones. Then make the same number but use only ones, so 14 ones. Talk about how the value of the number remains the same and use the model to build understanding.
- Incorporate math into mealtime. Find examples of place value problems while cooking, baking or serving a meal.
- Play 'Base Ten Bingo': Make a simple bingo board with 9 spaces on a piece of paper. Write numbers 11-19 on the spaces in a random order. Then on separate sheets of paper, write the numbers 11-19 and fold them and put them in a bowl. Take turns drawing a number. When a number is drawn, players must model that number using base ten blocks (or a homemade version), by showing it on a number line or finding it on a hundreds chart. Then they get to cover that number. Play for three in a row, four corners or cover all!
- Play 'Number Chance': Write numbers 11-19 on post its or small pieces of paper. Fold them up and put them in a bowl/hat. Draw a number, then flip a coin. If it lands on heads, make the number using base ten blocks (or a pretzel/Cheerio base ten model), and if it lands on tails, then find the number on a hundreds chart (or make a number line 1-20 and find the number on a number line).

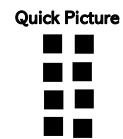
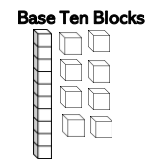
## Addition Models

18

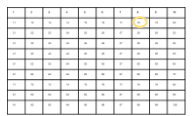
Place Value Chart

Tens	Ones
1	8

Base Ten Block Model



Hundreds Chart



## Math at Mealtime

- Make a base ten snack! Choose a few two-digit numbers (between 11-19) to model. Use pretzel rods to represent tens and Cheerios, M&Ms or blueberries to represent ones. Write the number and model it using this base-ten model. Then enjoy the treat!
- Cook/bake a food for 11 minutes (boiling noodles is a great example). Talk to your child about how it took 11 minutes, and write the number. Look closely at that number together and talk about the difference between the 1s in that number.

## Did You Know?

Kindergarten is the first time that children begin learning about our base ten number system.

Building a foundation of conceptual understanding of place value (the meaning of tens and ones, and that one ten is the same value as ten ones) is critical for success with operations with whole numbers (and in upper grades, decimals).

## Family Read Aloud Books & Games

- *When I Am Bigger* by Maria Dek
- *Place Value Party* by Courtney O'Grady
- *Lia and Luis Who Has More* by Ana Crespo



# MEASUREMENT & DATA

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## Quick Skills Check

- ❑ I can describe measurable attributes of objects such as length or weight
- ❑ I can directly compare two objects with a measurable attribute in common to see which object has more of/less of the attribute (*for example, compare the height of two objects to see which is taller or shorter*)
- ❑ I can sort a collection of objects into a given category with 10 or less in each category. Compare the categories by size

## Math Talk Moments

*Some conversation starters for engaging your child in math talk.*

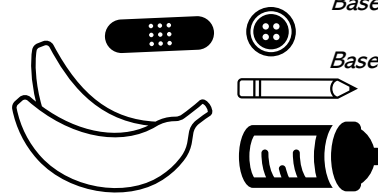
- Let's compare our height! Who is taller, you or me? How do you know? What tool could we use to measure our height? *Compare heights of siblings and other family members.*
- What are a few different ways we could measure this notebook? *Length, width, weight*
- Can you help me sort my rock collection by color? How about by size? What other categories could we organize my rock collection into?
- I want to organize my sticker collection (*or other collection*), what are some categories that I could use to sort it?

## Activities to Build MEASUREMENT SKILLS

- ❑ Make a family height line. Have everyone in your family stand back-to-back with one another to see who is taller. Then line up with the tallest on one end and the shortest on the other. Describe the relationship between each person by saying 'Person A is taller than Person B, so Person B is shorter than Person A.'
- ❑ Incorporate math into mealtime. Find examples of measurement while cooking, baking or in the kitchen.
- ❑ Do a measurement scavenger hunt. Choose one item as the 'compare' item, such as a pencil. Then go on a hunt looking for objects that are longer than the pencil and shorter than the pencil. Record them on a recording sheet, take pictures or actually collect the items. You can bring the pencil on the hunt to use as a base unit for comparison. *As an extension, you can also do a scavenger hunt by weight, looking for objects that are heavier or lighter than a base object.*
- ❑ Make a family 'summer collection': choose an object that is small and fairly easy to collect, *such as seashells from a vacation, rocks, stickers, toy cars, sticks, cards etc.* Sort the collection into different categories. Some category ideas include *sort by shape, by size, by length, by color, by weight, by texture etc.*
- ❑ Play 'Would You Rather': comparing various items with different length and height. *Ex: would you rather have a play house that is taller than you or shorter than you? Would you rather eat a sandwich that weighs more than a toy car or less? Integrate real world and also some silly answers to make this game more fun, while still relating back to measurement.*

## Measurement Models

Sort These Items:



*Based on length (longer or shorter than a pencil)*

*Based on weight, heavier or lighter than a pencil*

*Based on color*

*Based on texture*

## Math at Mealtime

- Put a variety of colors and sizes of foods on your child's plate. Give your child a category *such as color, weight, size (big and small), or other category like sharp edges and rounded edges*, and have them sort their plate into two different categories. *Challenge, sort your food at the same time and try to use different categories than your child to inspire them to think creatively about ways to sort objects.*
- Give your child three foods that have length that is easily measured (*for example: a celery stalk, a carrot stick and a green bean*). Compare two foods at a time (*ex: which is longer, the celery stalk or the carrot stick?*), then use this to determine the longest and shortest of the set of foods.

## Did You Know?

In Kindergarten, children are not expected to use a ruler and understand inches, centimeters or millimeters as measurement units yet or a scale with pounds and ounces. The goal of kindergarten measurement is to build a foundation of understanding that objects have attributes that can be measured and compared. *It is of course okay to show them a ruler or scale and real measurement units, but that does not need to be the focus of measurement activities at this level.*

## Family Read Aloud Books & Games

- **How Long or How Wide: A Measuring Guide** by Brian P. Cleary
- **Is It Larger? Is It Smaller?** By Tana Hoban
- **How Many Flamingos Tall is a Giraffe?** by Clara Cella
- **Ants Rule: The Long and Short of It** by Bob Barner
- **How Tall Am I? Measurement Game**

# GEOMETRY

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## Quick Skills Check

- I can describe objects in the environment using names of shapes
- I can describe relative position of objects using terms such as *above, below, beside, in front of, behind, between and next to*
- I can correctly name shapes regardless of their orientations or overall size
- I can identify shapes as two-dimensional or three-dimensional
- I can describe similarities and differences between two- and three-dimensional shapes, in different sizes and orientations
- I can model shapes in the world by building and drawing shapes
- I can compose larger shapes using simple shapes and identify smaller shapes within a larger shape

## Math Talk Moments



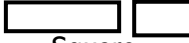



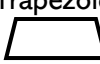



Some conversation starters for engaging your child in math talk.

- Look at signs on the road while driving (safely) or while parked. What shape is that sign? How many sides does it have? What is the name for a shape with that many sides. *Find a yield sign. Ask if it is a triangle—discuss the fact that it is not 'upside down' because triangles can have any orientation as long as they are a 3-sided closed figure). Look for other examples like this.*
- Look around the room (or car etc.), what is something that is above you? What is below you? What is in front of you? What is in between you and me?
- What is your favorite shape? Why?

## Activities to Build GEOMETRY UNDERSTANDING

- Shape Sort: Draw a picture of a variety of 2-D shapes (or cut them out on various colored paper). Make the shapes different colors and sizes but include some of the same shape. For example, a blue circle and a green circle, or a big circle and a small circle, a red right triangle, a red equilateral triangle and a blue isosceles triangle. Have your child sort the shapes into categories and explain their categories. Once they sort them one way, see if they can sort them in another way. Encourage naming shapes (*although just basic names such as triangle, not specific names like right triangle is appropriate at this level*).
- Incorporate math into mealtime. Find examples of geometry problems while cooking, baking or serving a meal.
- Play 'Scavenger Hunt': Go on a scavenger hunt around your house, classroom, yard, favorite store etc. Look for various shapes such as triangles, squares, trapezoids, rectangles, circles, half circles, quarter circles, cones, cylinders, prisms and cubes. Take pictures and make a Google Doc or other online document with the categories and pictures. Add to this doc throughout the day, week, month etc. Discuss what is the same and different about each shape—for example if you see a square sticker and a rectangular poster, discuss that they both have 4 sides but one has equal sides and one does not. *You can also categorize shapes by 2-D and 3-D and notice similarities and differences.*
- Play 'Shape Draw': spend some time drawing together with your child. Name a shape, like rectangle and at the same time on your own paper draw a rectangle too. Try it again with another shape. Emphasize that not all rectangles look the same (*like the pictures in the Geometry models on this page*). You can extend this by playing 'Name My Shape' where each of you draws a shape and the other has to name the shape that the other person drew, using geometry vocabulary.

### Geometry Models

<b>2-D Shapes</b>	<b>3-D Shapes</b>
Triangles 	Cube 
Rectangles 	Cone 
Square 	Cylinder 
Trapezoid 	Rectangular Prism 
Circle 	
Rhombus 	

This triangle is not 'upside down' it just has a different orientation. Both are triangles.

## Math at Mealtime

- Food shapes: Eat a snack or meal with a variety of food shapes (ex: square bread, circular apple slice, rectangular graham cracker etc.) Discuss the shapes and try to name them. Look for two foods that are the same shape but different color or different size *Ex: circular large watermelon slice and circular apple slice. Or graham cracker rectangle and chocolate piece rectangle. Discuss the fact that they are the same shape even though different size and color.*
- Strategically place foods on your child's plate and talk to them about the positioning of the foods. Asking questions such as "what food is above the grapes?" "What food is next to the sandwich?" "What food is below the carrots?" etc.

## Did You Know?

Kindergarten geometry is a critical foundation for geometry and fractions in elementary math and beyond. Helping children learn about two-dimensional and three-dimensional shapes is important for developing visual thinking and problem-solving skills.

## Family Read Aloud Books & Games

- **A Trapezoid is Not A Dinosaur** by Suzanne Morris
- **The Greedy Triangle** by Marilyn Burns
- **Which One Doesn't Belong?** by Christopher Danielson
- **Shapes that Roll** by Karen Nagel
- **All Shapes Matter** by Sreekanth Kumar, Chakra Sreekanth
- **Drop It A family game**
- **Scramble! A Shapes Matching Family Board Game**

# ADDITIONAL RESOURCES

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The Dog

Ate My

Homework

PODCAST  
GUIDE

*The Dog Ate My Homework Podcast was designed to empower caregivers to support their children with math at home. It includes grade-level specific math information, tips, games and ideas to try! Check out these helpful episodes!*

- Episode 1: *Supporting Your Child's Growth Mindset in Math*
- Episode 2: *Homework Routines: Setting Your Child Up For Success on Math Homework*
- Episode 4: *What is this 'New Math' Anyway?*
- Episode 6: *Quick Homework Troubleshooting Tips*
- Episode 7: *Addition in Kindergarten: How You Can Support Your Child While Keeping Math Fun*
- Episode 8: *Supporting Your Kindergartener With Subtraction Strategies*
- Episode 9: *Kindergarten Wrap Up: Where to Start Supporting Your Child*

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